

What Works Clearinghouse



Beginning Reading

September 28, 2006

DaisyQuest

Program description *DaisyQuest* is a software bundle that offers computer-assisted instruction in phonological awareness, targeting children aged three to seven years. The instructional activities, framed in a fairy tale involving a search for a friendly dragon named Daisy, teach

children how to recognize words that rhyme; words that have the same beginning, middle, and ending sounds; and words that can be formed from a series of phonemes presented separately, as well as how to count the number of sounds in words.

Research Four studies met the What Works Clearinghouse (WWC) evidence standards. The studies included a total of 223 students ranging in age from five to seven years, attending schools in different communities and states, including one western and one

southeastern state. The studies examined *DaisyQuest*'s effects in the alphabetics domain, specifically on phonological awareness and phonics measures.¹

Effectiveness *DaisyQuest* was found to have positive effects on alphabetics skills.

	Alphabetics	Fluency	Comprehension	General reading achievement
Rating of effectiveness	Positive	Not reported	Not reported	Not reported
Improvement index²	Average: +23 percentile points Range: -18 to +45 percentile points	Not reported	Not reported	Not reported

1. The evidence presented in this report is based on the available research. Findings and conclusions may change as new research becomes available.

2. The improvement index is based on the average effect size within a domain, and the range of improvement indices represents the minimum and maximum of all individual findings across all studies.

Additional program information

Developer and contact

Gina C. Erickson (DaisyQuest@comcast.net)

Scope of use

DaisyQuest was developed in 1992. Information is not available on the number or demographics of students, schools, or districts using the software.

Teaching

DaisyQuest is a software program comprised of two components that focus on recognition of rhyming; recognizing words with the same beginning, middle, and ending sounds; forming words from a series of phonemes; and counting sounds in words. The software uses graphics and story lines to engage children in the learning process. In the first component, called *DaisyQuest*, as children master each level of instructional activities they are rewarded with clues that lead them to discover where Daisy is hiding. In the second component, *Daisy's Castle*, a similar fairy tale theme involves searching for Daisy's lost eggs. The programs also offer children choices about the sequence of instructional activities and keep track of children's responses. Materials are presented using digitized and synthetic speech. The software contains a tutorial

that guides the child by explaining each skill or concept briefly and provides practice exercises with feedback for correct and incorrect responses. When the activity is completed the child's mastery of the concept is tested through activities and questions. Included with the program is an adaptive test called *Undersea Challenge*. This test measures children's knowledge of rhyming; beginning, middle, and ending sounds; and phoneme blending and segmenting. The software generates statistical reports that enable parents and teachers to view children's performance.

In each of the four studies reviewed, classroom teachers did not direct students' use of *DaisyQuest* (studies were conducted by experimenters). However, the software is self-contained and teachers may send students to the computer to practice these skills, without any need to implement additional curricular materials. Though not stipulated by the program developer, the students in the reviewed studies used the computer program for 15–32 sessions, each lasting 20–25 minutes.

Cost

The *DaisyQuest* bundle (*DaisyQuest*, *Daisy's Castle*, and the *Undersea Challenge* mastery test) is available for \$49.95, plus \$6.95 shipping and handling.

Research

Five studies reviewed by the WWC investigated the effects of the *DaisyQuest* program. Four studies (Barker & Torgesen, 1995; Foster, Erickson, Foster, Brinkman, & Torgesen, 1994, Experiment 1: Child-care Facility; Foster, Erickson, Foster, Brinkman, & Torgesen, 1994, Experiment 2: Kindergarten Classrooms; and Mitchell & Fox, 2001) were randomized controlled trials that met WWC evidence standards. The one remaining study did not meet WWC evidence screens. In two of the studies, the authors used two groups to make comparisons to the intervention group. The beginning reading review presents data relevant to all comparisons.³

Barker and Torgesen (1995) presented results for 49 at-risk first graders who had been randomly assigned to one of three conditions: *DaisyQuest*, *Hint and Hunt*, a software program that teaches short vowel sounds, or computer time to work with math-oriented software programs.⁴

Foster et al. (1994, Experiment 1: Child-care Facility) analyzed outcomes of 27 students randomly assigned to use *DaisyQuest* or to continue receiving only their regular school program.

Foster et al. (1994, Experiment 2: Kindergarten Classrooms) examined results for 69 kindergarteners who were randomly

3. Considering all comparison groups, rather than selecting one comparison over another, is especially important in a topic such as reading, where there is generally no true control (absence of reading instruction).

4. In this and the Mitchell and Fox (2001) study, the authors include students working with math and drawing software programs to account for the possibility that working with any software programs may improve reading skills.

Research *(continued)*

assigned to one of two conditions: *DaisyQuest* or their regular kindergarten curriculum.

Mitchell and Fox (2001) focused on 69 students randomly assigned to one of three conditions: *DaisyQuest* (intervention),

teacher-delivered phonological awareness instruction, where teachers guided students through oral activities (comparison 1), or mathematics and drawing software programs (comparison 2).

Effectiveness Findings

The WWC review of beginning reading addresses student outcomes in four domains: alphabetics, reading fluency, comprehension, and general reading achievement.⁵ *DaisyQuest* studies addressed outcomes in alphabetics and included outcomes for two constructs within alphabetics—phonological awareness and phonics. All four *DaisyQuest* studies (Barker & Torgesen, 1995; Foster et al., 1994, Experiment 1: Child-care Facility; Foster et al., 1994, Experiment 2: Kindergarten Classrooms; Mitchell & Fox, 2001) used phonological awareness measures. Barker and Torgesen (1995) also used phonics measures. The findings below present authors' estimates and WWC-calculated estimates of the size and statistical significance of the effects of *DaisyQuest* on students. Sometimes the two differ, reflecting WWC calculations based on data provided by the authors (see Appendix A3).⁶

Alphabetics. The Barker and Torgesen (1995) study findings are based on the performance of *DaisyQuest* students and comparison students on five measures of **phonological awareness** and four measures for **phonics** in each set of comparisons.

When the *DaisyQuest* group was compared with the alternative reading software group, the study authors found statistically significant effects favoring the *DaisyQuest* group for three of the five **phonological awareness** measures. The WWC analysis found that two of five positive effects for **phonological awareness** (*Undersea Challenge* and Production Test of Segmenting)

were statistically significant. One additional positive effect (Phoneme Elision Test), while not statistically significant, was large enough to be considered substantively important according to WWC criteria.⁷ The study authors also found a statistically significant effect favoring the *DaisyQuest* group for one of the four **phonics** measures (Woodcock-Johnson Word Identification subtest). The WWC effect size computations found none of the four positive effects for **phonics** to be statistically significant; but three effects (Woodcock-Johnson Word Identification subtest, Woodcock-Johnson Word Analysis, and Experimental Non-word Reading) were large enough to be considered substantively important according to WWC criteria.

When the *DaisyQuest* group was compared with the math-oriented software, the study authors found, and the WWC confirmed, statistically significant effects favoring the *DaisyQuest* group for two of the five **phonological awareness** measures (*Undersea Challenge* and Production Test of Segmenting). The other three positive effects (Phoneme Elision Test, Sound Categorization, and Production Test of Blending), while not statistically significant, were large enough to be considered substantively important according to WWC criteria. The study authors also found a statistically significant effect favoring the *DaisyQuest* group for one of the four **phonics** measures (Woodcock-Johnson Word Identification subtest) but this was not confirmed by the WWC. According to WWC calculations, there were three positive effects (Woodcock-Johnson Word

5. For definitions of the domains, see the [Beginning Reading Protocol](#).

6. The level of statistical significance was calculated by the WWC and, where necessary, corrects for clustering within classrooms or schools, for multiple outcomes within one domain, and for multiple comparisons. For an explanation see the [WWC Tutorial on Mismatch](#). See the [Technical Details of WWC-Conducted Computations](#) for the formulas the WWC used to calculate the statistical significance. In the case of *DaisyQuest*, corrections for multiple outcomes and for multiple comparison groups were needed.

7. A substantively important effect is defined as an effect size greater than positive or negative 0.25.

Effectiveness *(continued)*

Identification subtest, Woodcock-Johnson Word Analysis, and Experimental Non-word Reading) that, while not statistically significant, were large enough to be considered substantively important. The one negative effect (Analog Reading Task) found by the WWC was neither statistically significant nor substantively important according to WWC criteria.

Foster et al. (1994, Experiment 1: Child-care Facility) used two phonological awareness tests (phonological awareness test (b) and the screening test of phonological awareness—experimental version). For both measures, the authors found, and the WWC confirmed, positive, statistically significant effects in favor of the *DaisyQuest* group.

Foster et al. (1994, Experiment 2: Kindergarten Classrooms) used four phonological awareness tests. The authors found, and the WWC confirmed, positive, statistically significant effects favoring the *DaisyQuest* group on three measures (*Undersea Challenge*, Production Test of Segmenting, and Production Test of Blending).

Mitchell and Fox (2001) used the Phonological Awareness Test (a), which included a total test score and four subtests for each of the two comparison groups. Only the total test score was included in the effectiveness rating.⁸ In the comparison between the *DaisyQuest* group and the teacher-delivered phonological awareness group, the authors found no statistical

differences on the total test score. According to WWC effect size computations, there was a negative effect—that is, the *DaisyQuest* group scored lower than the teacher-led group on this measure. Although the effect was not statistically significant, it was large enough to be substantively important by WWC standards. In the comparison of *DaisyQuest* students and students using the other instructional technology, the study authors found, and the WWC confirmed, statistically significant positive effects on the total test score for the *DaisyQuest* group.

For alphabetics, three studies were categorized as having positive effects and had strong designs. One study had a strong design and was categorized as having indeterminate effects.

Rating of effectiveness

The WWC rates interventions as positive, potentially positive, mixed, no discernible effects, potentially negative, or negative. The rating of effectiveness takes into account four factors: the quality of the research design, the statistical significance of the findings (as calculated by the WWC), the size of the difference between participants in the intervention condition and the comparison condition, and the consistency in findings across studies (see the [WWC Intervention Rating Scheme](#)). Overall, the WWC found *DaisyQuest* to have positive effects for alphabetics.

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Improvement index

For each outcome domain, the WWC computed an improvement index based on the effect size (see the [Technical Details of WWC-Conducted Computations](#)). The improvement index represents the difference between the percentile rank of the average student in the intervention condition versus the percentile rank of the average student in the comparison condition. Unlike the rating of effectiveness, the improvement index is entirely based on the size of the effect, regardless of the statistical significance

of the effect, the study design, or the analysis. The improvement index can take on values between –50 and +50, with positive numbers denoting favorable results. The improvement index range across all individual outcomes for alphabetics is –18 to +45 percentile points. The improvement index based on the domain average effect size across all studies is +23 percentile points. That is, the average student in the comparison group would be expected to improve from the 50th percentile to the 73rd percentile after receiving the intervention.

8. The WWC does not include subtests in the effectiveness ratings of each study to avoid counting one test multiple times. But effect size estimates on the subtests are presented in Appendix A4.1.

The WWC found *DaisyQuest* to have positive effects for alphabetics (continued)

Summary

The WWC reviewed four studies on *DaisyQuest* that met WWC evidence standards; each focused on outcomes in the alphabetics domain. The WWC categorized three of the four studies as having statistically significant effects and one study

as having indeterminate effects. So, when the WWC looked at results from *DaisyQuest* in aggregate, the intervention was found to have positive effects on alphabetics. The evidence in this report is limited and may change as new research become available.

References

Met WWC evidence standards

Barker, T., & Torgesen, J. K. (1995). An evaluation of computer-assisted instruction in phonological awareness with below average readers. *Journal of Educational Computing Research*, 13(1), 89–103.

Foster, K. C., Erickson, G. C., Foster, D. F., Brinkman, D., & Torgesen, J. K. (1994). Computer administered instruction in phonological awareness: Evaluation of the *DaisyQuest* program. *Journal of Research and Development in Education*, 27(2), 126–137. (Experiment 1: Child-care Facility).

Foster, K. C., Erickson, G. C., Foster, D. F., Brinkman, D., & Torgesen, J. K. (1994). Computer administered instruction

in phonological awareness: Evaluation of the *DaisyQuest* program. *Journal of Research and Development in Education*, 27(2), 126–137. (Experiment 2: Kindergarten Classrooms).

Mitchell, M. J., & Fox, B. J. (2001). The effects of computer software for developing phonological awareness in low-progress readers. *Reading Research and Instruction*, 40(4), 315–332.

Did not meet WWC evidence standards

Lonigan, C. J., Driscoll, K., Phillips, B. M., Cantor, B. G., Anthony, J. L., & Goldstein, H. (2003). A computer-assisted instruction phonological sensitivity program for preschool children at-risk for reading problems. *Journal of Early Intervention*, 25(4), 248–262.⁹

For more information about specific studies and WWC calculations, please see the [WWC *DaisyQuest* Technical Appendices](#).

9. The age of the students in this study was outside the range of this review.